Developing a Driver Library for Engine Controllers with AUTOSAR Complex Device Drivers (CDD)

Case Study FAW

The Customer
The FAW Group Cooperation, the “First Automotive Works,” with its headquarters in Changchun, is the largest Chinese manufacturer of diesel engines, passenger cars and medium- to heavy-duty buses and trucks. FAW produces over 2.5 million vehicles annually and is one of the first Chinese OEMs to implement AUTOSAR.

The Challenge
Developing a driver library for engine controllers with AUTOSAR Complex Device Drivers (CDD).

FAW is developing a new generation of its engine controllers and is consistently implementing AUTOSAR basic software in this process. This software will be implemented as one platform which is capable of controlling both gasoline and diesel engines. Since AUTOSAR does not define any suitable drivers for engine controllers, FAW wants to extend their AUTOSAR driver library. They would like to be able to select the necessary sensors and actuators from a toolkit and configure them in the desired quantities and types with the help of a universal tool chain.

The Solution
Configuration and code generation of the engine-specific drivers with the existing AUTOSAR tool chain from Vector.

Vector implemented the drivers for controlling engine-specific sensors and actuators as what are known as Complex Device Drivers (CDD). To configure the drivers, the relevant Basic Software Module Description (BSWMD) files were generated with the DaVinci Configurator Kit. The code generators were also created with the DaVinci Configurator Kit. DaVinci Configurator Pro reads the BSWMD files and links the associated code generators. This lets it configure the drivers for the engine controller and the AUTOSAR basic software.

The Advantages
A domain-specific driver library that can be extended by FAW.

> All basic software is configured and generated with a single tool: Both the AUTOSAR standard modules and the special drivers for engine control are configured with DaVinci Configurator Pro.
> The driver library can be extended or modified with the DaVinci Configurator Kit, e.g. when new sensors or actuators are introduced.
> Reduced administrative effort by having a central department that maintains and extends the library. Different vehicle projects have access to the central library and configure it for their specific engine controllers with DaVinci Configurator Pro.
> The process and interfaces conform to AUTOSAR specifications: The control algorithms for engine control are still developed with Matlab and Simulink and are implemented as AUTOSAR software components (SWC). They interface with the AUTOSAR basic software and engine-specific drivers via the RTE.